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DISEASES OF THE NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

CONTENTS:

ANOXIA AND COMPOUNDS CAUSING MENTAL DISORDERS IN MAN ..... Page 365
Lewis Danziger, M.D., Wauwatosa, Wisconsin

HYPNOANALYSIS AS PSYCHOTHERAPY ..... Page 371
Robert M. Lindner, Ph.D., Catonsville, Maryland

EDUCATION, RE-EDUCATION AND PSYCHOTHERAPY ..... Page 375
J. W. Klapman, M.D., Chicago, Illinois

NEUROLOGICAL CLINICAL PATHOLOGICAL CONFERENCE ..... Page 379

INDUSTRIAL PSYCHIATRY—A NEW FIELD FOR THE PSYCHIATRIST ..... Page 384
Lowell S. Selling, M.D., Detroit, Michigan

INDEX ..... Page 387

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DISEASES of the NERVOUS SYSTEM

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A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Anoxia and Compounds Causing Mental Disorders in Man *

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Since the introduction of the various chemical and physical methods of treatment of certain types of mental disorders, there has been an increasing interest in the problem of modifying human behavior by pharmacologic methods. Even earlier, however, there had existed a considerable body of knowledge concerning the adverse effect on behavior of a number of chemical compounds, although no attempt was made to give a unified explanation of their effects. Study of the materials having an undesirable effect on behavior may throw some light on the converse problem of interpreting the favorable results of shock therapy. Such a study is undertaken in the present investigation.

It is now known that a large group of compounds will produce in man some of the symptoms frequently seen in association with mental disorders. Among them are depression, excitement, confusion, delusions, hallucinations and stupor. Patients presenting these symptoms as a result of exposure to drugs or poisons constitute a group in which, in effect, mental disorders have been produced experimentally.

Analysis of the properties of the compounds involved might reveal a common physiological explanation for the results. While the materials are quite heterogeneous in their principal chemical and pharmacologic properties, the fact that they share a common group of toxic reactions indicates that they should have at least one common physiologic effect. Nothing is meant to be implied in this study as to the mechanism of the various desirable effects of the compounds; attention is confined to the common toxic side-reaction.

Materials, Methods and Assumptions

A number of textbooks of pharmacology, toxicology and psychiatry were examined for reports of abnormalities of behavior resulting from exposure to compounds of known composition. Reports appearing only in the periodical literature were not relied upon because it was desired to include in this study only toxic reactions sufficiently common or important to be described in standard texts. It was necessary to use some judgment in translating the terms of pharmacologists and toxicologists into the language of psychiatry. For example, it was not considered a reasonable assumption that delirium, a word of restricted and fairly definite meaning to psychiatrists, was always used in its technical sense by pharmacologists and toxicologists. When the description in the text-book was not sufficiently clear or definite for translation with reasonable assurance into psychiatric language, the compound was excluded.

Mixtures causing symptoms of mental disorder are excluded from the study. Among them are digitalis, thyroid, marihuana, opium, peyote, mushrooms, ergot, gasoline,

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benzine and turpentine. Compounds derived from a mixture and known to cause abnormal behavior when given alone are included; an example is morphine. Compounds reported in the texts examined as causing only terminal delirium or delirium associated with pneumonia are excluded.

The following materials were found to satisfy the criteria given above:

acetaldehyde[26]
acetanilid[27]
alcohol[69]
anilin[29]
antimony[26]
antipyrine[26]
arsenic[26]
atropine[26]

barbiturates[69]
benzedrine[27]
benzene[29]
borax[26]
bromide[69]

caffein[27]
camphor[27]
carbon dioxide[27]
carbon disulfide[27]
carbon monoxide[69]
carbon tetrachloride[27]
chloral[16]
chloral hydrate[27]
chlorate[12]
cocaine[27]
codeine[27]
copper[26]
cyanide[26]

dilantin[27]

ether[29]

formaldehyde[27]

iodoform[26]

lead[26]

manganese[29]
mercury[29]
mescaline[69]
methyl bromide[26]
methyl chloride[26]
morphine[69]
muscarine[68]

nicotine[26]
nitrobenzene[27]
nitroglycerin[29]

paraldehyde[16]
phenacetin[27]
phenol[29]
phosphorous[26]
pilocarpine[26]
pyridine[26]

quinine[27]

salicylic acid[26]
santonin[27]
scopalamine[27]
sulfanilamide[27]
sulfapyridine[27]
sulfonal[26]

tetrachlorethane[26]
thallium[27]
thiocyanate[27]
thymol[27]
toluidine[29]
trional[74]

vanadium[29]

It is not contended that this is a complete catalogue.

From inspection of the list above it is clear that the compounds can have no common property based on molecular dimensions, configuration or side chains. There is no atom common to all the materials. They differ widely in their solubilities and other physical properties. Pharmacologically they include soporifics, narcotics, anesthetics, analgesics, antiseptics, disinfectants, stimulants, diuretics, convulsants, anti-convulsants, vaso-dilators, vaso-constrictors, therapeutic gases, and some are without pharmacologic value.

A few are commonly known to cause anoxia of one or another of the types described by Peters and Van Slyke.[51] It is a matter of common knowledge also that interference with the normal chain of reactions concerned in the metabolism of oxygen and carbohydrate, as for example in nicotinic acid deficiency or in ascent to high altitudes without oxygen, may cause abnormalities of behavior. In this study is presented the evidence for the effect of the materials on the metabolism of carbohydrate and oxygen. This evidence has been collected from the English, French and German literature, to which attention was confined because of language difficulties. When satisfactory reviews have been found, reference is given to them for brevity in preference to a more complete bibliography of original publications.

For several reasons no account is taken in this study of the amount of material ingested. Some of the compounds have no therapeutic use (for example benzene, carbon disulfide, formaldehyde, vanadium) so that it is impossible to specify the median therapeutic dose. In other cases, susceptible individuals may develop toxic symptoms after taking much less than the usual dose. In the case of some industrial poisons, it is often impossible to determine the concentration in the body or in the principally affected organ when symptoms develop.

It is not claimed that the clinical picture due to drug or poison is identical with that of any spontaneous mental disorder, although it is true that in many cases the distinction would be difficult without a history. It is claimed only that some of the symptoms following the ingestion of drugs and poisons are very similar to some of the symptoms seen in the ordinary mental disorders. And of course it is not claimed that any material listed is the cause or a cause of any spontaneous abnormality.

It is assumed that disturbances of behavior have their origin in the brain, although the details of the symptoms may be determined by less well defined factors such as personality, past experience and the like.

Definition of Anoxia

Peters and Van Slyke[51] have classified the types of anoxia as:

1) anoxic, due to decreased oxygen pressure, inadequate respiratory movements or pulmonary edema.
2) anemic, due to decreased concentration of normally reacting hemoglobin.
3) stagnant, due to failure of the circulation.
4) histotoxic, due to failure of the tissue cells to utilize oxygen.

The reader is referred to the reviews of Elvehjem and Wilson,[18] Oppenheimer,[49] Oppenheimer and Stern,[50] and Quastel[52, 53] for discussion of the known details of the intermediate reactions and enzymes concerned with oxygen and carbohydrate consumption. From these reviews, it is clear that the following conditions are necessary for the normal metabolism of the brain:

1. an adequate supply of oxygen, insured by
   a) adequate pulmonary ventilation
   b) adequate circulation
   c) adequate, normally functioning, hemoglobin.
2. an adequate supply of glucose or other satisfactory carbohydrate.
3. adequately functioning enzymes for the activation of oxygen and substrate in the tissues, insured by
   a) normal pH and temperature
   b) absence of enzyme inhibitors in effective concentration.

Failure of one or more of these conditions establishes or tends to establish a situation comparable to that of the aviator or pellagrin and hence, by analogy, a situation conducive to mental disorder. The same analogy brings to mind the abnormal behavior sometimes associated with heart disease, spontaneous hypoglycemia, anemia and pneumonia.

Materials Causing Anoxia

1. *Anoxic anoxia.* The materials reported to cause anoxic anoxia by inducing pulmonary edema or curarization are:

muscarine[12, 68]	pilocarpine[27]
nicotine[27]	quinine[23, 31]

2. *Anemic anoxia.* Materials reported to convert hemoglobin into a compound incapable of reacting normally with oxygen and delivering oxygen normally to the tissues are listed below. For present purposes, it makes no difference whether the abnormal compound is methemoglobin, carboxyhemoglobin, cyanhemoglobin, sulfhemoglobin or some other material. The materials are:

acetanilid[27, 51, 59, 73]	nitroglycerin[73]
anilin[27, 51, 59, 73]	phenacetin[27, 51]
carbon monoxide[51]	sulfanilamide[27, 67]
chlorate[51]	sulfapyridine[27, 67]
cyanide[51]	sulfonal[27]
manganese[51]	toluidin[59, 73]
nitrobenzene[51, 59, 73]	trional[27]

3. *Histotoxic anoxia.* The succeeding lists contain the compounds reported to inhibit one or more of the enzymes concerned in the activation of oxygen or carbohydrate substrate or both, or in the removal of intermediate or end products of metabolism. For present purposes, it makes no difference what portion of the enzyme-substrate bucket brigate system is affected. The result of a successful attack on the system at any point will be the same as far as over-all tissue metabolism is concerned.

For details as to the evidence of inhibition, the reader is referred to the sources given. The techniques generally used involved the spectroscope, respirometer or Thunberg tube.

The following compounds are reported to inhibit carbonic anhydrase:

chlorate[70]	manganese[70]
copper[60]	mercury[60]
cyanide[35]	sulfanilamide[41, 43, 61]
formaldehyde[41]	thiocyanate[14, 70]
	vanadium[60]

The following are reported to inhibit catalase:

carbon monoxide[18]	methyl chloride[10]
carbon tetrachloride[10]	phenol[19]
chlorate[8, 19]	phosphorous[49]
cyanide[18]	sulfanilamide[11, 42, 47]
mercury[9, 19]	sulfapyridine[11]

The following are reported by Elvehjem and Wilson[18] to inhibit cytochrome oxidase or one or more of the cytochromes: alcohol, carbon monoxide, cyanide and formaldehyde.

The following are reported to inhibit dehydrogenases:

acetaldehyde[18, 48, 49, 70]	cocaine[66]
alcohol[30]	copper[18, 20, 39, 57]
antimony[49]	lead[70]
arsenic[18]	mercury[20, 39, 70]
barbiturates[15, 25]	quinine[66]
bromide[62]	salicylate[40]
carbon dioxide[39]	thiocyanate[62]
carbon disulfide[49, 59]	

The following are reported to impair the respiration of brain tissue, *in vitro:*

alcohol[32]	cocaine[54, 75]
atropine[54]	ether[34, 64]
barbiturates[22, 32, 33, 54, 64, 75]	lead[17]
benzedrine[44]	mescaline[55, 56]
bromide[75]	morphine[28, 54]
chloral[55]	nicotine[3, 53]
chloral hydrate[32, 54]	paraldehyde[54]
	scopalamine[54, 55, 56]

The following are reported to impair the respiration of other mammalian tissue, *in vitro:*

anilin[7]	chloral hydrate[21]
arsenic[72]	lead[17]
barbiturates[21, 79]	phenol[7]
borax[36, 37]	salicylate[1]
caffein[49, 66]	thallium[37]
carbon dioxide[24]	

4. *Other Respiratory Depressants.* Goodman and Gilman[27] state that the following are respiratory depressants when given in sufficient doses:

alcohol	ether
barbiturates	morphine
carbon dioxide	salicylates
codeine	santonin

Not included in this group are materials described only as causing death by respiratory failure. The following are reported to depress the respiration of the intact mammal:

barbiturates[13, 65]	manganese[58]
carbon dioxide[4]	phosphorus[63]
codeine[76, 77, 78]	santonin[38]

Astwood[2] found that thyroid activity is depressed by

acetanilid	sylfapyridine
sulfanilamide	thiocyanate

Some apparently conflicting evidence in the literature should be mentioned. Benzedrine is generally regarded and used as a mild respiratory stimulant, and Mann and Quastel[44, 45] have shown that it protects brain tissue respiration against the depressing effect of a number of amines and their aldehydes by inhibiting amine oxidase. This finding was confirmed by Blaschko.[9] However, Mann and Quastel[44] found that low concentrations of benzedrine had no effect on brain tissue respiration in the absence of an appropriate amine, and that higher concentrations depressed brain respirations.

Bernheim[5] and Bernheim and Bernheim[6] presented evidence that vanadium is a coenzyme or at least a promotor of oxygen consumption by mammalian liver and kidney with phospholipid as the substrate. Roughton[60] however, demonstrated the inhibition of carbonic anhydrase by vanadium. It is probable that no carbonic anhydrase was present in the material studied by Bernheim and Bernheim.

Discussion

Evidence has been collected from the literature showing that most of the materials included in this study interfere in some way or ways with the utilization of oxygen or carbohydrate or both. In the literature there was found no report of the effect of the following on the consumption of oxygen or carbohydrate:

antipyrine	methyl bromide
benzene	pyridine
camphor	tetrachlorethane
dilantin	thymol
iodoform	

Benzene is reported by Tschernikow, Gadaskin and Gurewitsch[71] to be converted to phenol in the isolated mammalian liver. If this is true, benzene is indirectly an inhibitor of catalase and of mammalian tissue respiration.

Probably it is less surprising that some compounds have not been adequately studied than that so many from an apparently heterogeneous group are already known to be inhibitors of oxygen or carbohydrate consumption. The size and apparent heterogeneity of the group makes it unlikely that all the members share many common properties; the discovery of a property known to be common to most of the group and not known to be lacking in any of them therefore is probably not without significance.

From the evidence given it is possible to conclude what was already known from previous reports on pellagra and other diseases;

namely, that interference with the respiratory mechanism is a sufficient condition for the development of symptoms of mental disorder. By no finite amount of evidence can it be shown that the same condition is necessary as well as sufficient. However, something may be gained by assuming the necessity of the condition. Such an assumption may stimulate new work on the physiological basis of spontaneous abnormalities of behavior and provide a framework to which may be referred further observations of patients with mental disorders. This is not the place to review the considerable body of clinical evidence already available in the literature which is consistent with the assumption of the necessity of the condition. In the present study, an attempt has been made to show that the assumption is plausible by reason of its reduction to order of a fairly large group of hitherto unrelated phenomena.

Summary

A partial catalogue of compounds causing symptoms of mental disorder in man has been prepared, and an attempt has been made to find a property common to all the materials. Study of the literature reveals that the majority are known to cause anoxia of the anoxic, anemic or histotoxic type, and that the relation of the remainder to anoxia has not been studied. From this evidence it is suggested that anoxia is a sufficient and perhaps a necessary condition for the development of abnormal behavior.

REFERENCES

1. Alwall, N. Steigerung des Citratstoffwechsels in vitro durch Salicylsaure. *Acta Med. Scanda.* (1939) *102,* 390.
2. Astwood, E. B. The chemical nature of compounds which inhibit the function of the thyroid gland. *J. Pharm.* (1943) *78,* 79.
3. Baker, Z., Fazekas, J. F. and Himwich, H. E., Carbohydrate oxidation in normal and diabetic cerebral tissues. *J. Biol. Chem.* (1938) *125,* 545.
4. Barbour, J. H. and Seevers, M. H. A comparison of the acute and chronic toxicity of carbon dioxide with especial reference to its narcotic action. *J. Pharm.* (1943) *78,* 11.
5. Bernheim, F. The action of aminopyrine and antipyrine on the oxidation of phospholipid by various tissues. *J. Pharm.* (1939) *66,* 459.
6. Bernheim, F. and Bernheim, M. C. L. The action of vanadium on the oxidation of phospholipids by certain tissues. *J. Biol. Chem.* (1939) *127,* 353.
7. Bernheim, F., Bernheim, M. C. L., and Michel, H. O. The action of p-amino-phenol on certain tissue oxidations. *J. Pharm.* (1937) *61,* 311.
8. Blaschko, H. Mechanism of catalase inhibitions. *Biochem. J.* (1935) *29,* 2303.
9. Blaschko, H. Amine oxidase and benzedrine. *Nature* (1940) *145,* 26.
10. Burge, W. E. and Burge, E. L. Effect of the chlorine substitution products of methane, acetaldehyde and of sodium acetate on catalase production. *J. Biol. Chem.* (1920), *41,* 307.
11. Clyman, M. The anti-catalase activity of sulfanilamide and sulfapyridine in vivo. *Ann. Int. Med.* (1940) *14,* 406.
12. Cushny, A. R. *Pharmacology and Therapeutics.* Lea and Febiger, Phila. 1936.
13. Dameshek, W., Myerson, A. and Loman, J. The effects of sodium amytal on the metabolism. *Am. J. Psychiat.* (1934) *91,* 113.
14. Davenport, H. W. The inhibition of carbonic anhydrase and of gastric acid secretion by thiocyanate. *Am. J. Physiol.* (1940) *129,* 505.
15. Davies, D. R. and Quastel, J. H. Dehydrogenations by brain tissue. The effects of narcotics. *Biochem. J.* (1932) *26,* 1672.
16. Diethelm, O. *Treatment in Psychiatry.* Macmillan Co., New York, 1936.
17. Dolowitz, D., Fazekas, J. F. and Himwich, H. E. The effect of lead on tissue metabolism. *J. Ind. Hyg. Tox.* (1937) *19,* 93.
18. Elvehjem, C. A. and Wilson, P. W. *Respiratory Enzymes.* Burgess Publ. Co., Minneapolis, Minn. 1940.
19. Euler, H. *General Chemistry of the Enzymes.* John Wiley and Sons, New York. 1912.
20. Euler, H. and Adler, E. Über die Komponenten der Dehydrasesystem. *Z. phys. chem.* (1935) *232,* 10.
21. Friend, D. G. Action of drugs on metabolism of tissue in serum. *Proc. Soc. Exp. Biol. Med.* (1940) *45,* 140.
22. Fuhrman, F. A. and Field, J. The relationship between chemical structure and inhibitory action of barbituric acid derivatives in rat brain respiration in vitro. *J. Pharm.* (1943) *77,* 392.
23. Gammon, G. D., Harvey, A. M. and Masland, R. I. On the nature of certain diseases of the voluntary muscles. *Biol. Symp.* (1941) *3,* 291.
24. Gesell, R. Respiration and its adjustments. *Ann. Rev. Physiol.* (1939) *1,* 185.
25. Girsavicius, J. O. Some properties of the enzyme glyoxalase. *Biochem. J.* (1932) *26,* 155.
26. Gonzales, T. A., Vance, M. and Helpern, M. *Legal Medicine and Toxicology.* D. Appleton-Century Co., New York. 1937.
27. Goodman, L. and Gilman, A. *The Pharmacological Basis of Therapeutics.* Macmillan Co., New York. 1941.
28. Gross, E. G. and Pierce, L. H. Effect of morphine on the oxygen consumption of brain tissue in the rat. *J. Pharm.* (1935) *53,* 156.
29. Hamilton, A. *Industrial Poisons in the United States.* Macmillan Co., New York. 1929.
30. Harrison, D. C. Dehydrogenases of animal tissue. *Ergeb. Enzymforsch.* (1935) *4,* 297.
31. Harvey, A. M. The actions of quinine on skeletal muscle. *J. Physiol.* (1939) *95,* 45.
32. Jowett, M. The action of narcotics on brain respiration. *J. Physiol.* (1938) *92,* 322.
33. Jowett, M. and Quastel, J. H. Effects of narcotics on tissue oxidations. *Biochem. J.* (1937) *31,* 565.
34. Jowett, M. and Quastel, J. H. Effects of ether on brain oxidations. *Biochem. J.* (1937) *31,* 1101.
35. Keilin, D. and Mann, T. Carbonic anhydrase: purification and nature of the enzyme. *Biochem. J.* (1940) *34,* 1163.

36. Kisch, B. Beeinflussung der Gewebsatmung durch Borverbindung. *Biochem. Z.* (1931) *235,* 35.
37. Kisch, B. Die Beeinflussung der Gewebsatmung in calciumsalzfreier Nahrlosung. *Biochem. Z.* 1931) *235,* 51.
38. Licht, H. Der Gaswechsel bei Kuhl- und Krampfgiften und seine nervose Beeinflussung. *Arch. f. exp. path. pharm.* (1927) *121,* 320.
39. Lohman, K. Beitrag zur enzymatischen Umwandlung von synthetischem Methylglyoxal in Milchsaure. *Biochem. Z.* (1932) *254,* 332.
40. Mahlen, S. Untersuchen über die Einwirkung der Benzoesaure und der drei isomeren Oxybenzoesauren auf die Succinodehydrogenase. *Skand. Arch. Physiol.* (1928) *53,* 152.
41. Main, E. R. and Locke, A. Carbonic anhydrase. I. Factors affecting activity. *J. Biol. Chem.* (1941) *140,* 909.
42. Main, E. R., Shinn, L. E. and Mallon, R. R. Anti-catalase activity of sulfanilamide and related compounds. *Proc. Soc. Exp. Biol. Med.* (1938) *39,* 272.
43. Mann, T. and Keilin, D. Sulfanilamide as a specific inhibitor of carbonic anhydrase. *Nature* (1940) *146,* 164.
44. Mann, P. J. G. and Quastel, J. H. Benzedrine and brain metabolism. *Nature* (1939) *144,* 943.
45. Mann, P. J. G. and Quastel, J. H. Benzedrine and brain metabolism. *Biochem. J.* (1940) *34,* 414.
46. McKee, R. W., Kiper, C., Fountain, J. H., Riskin, A. M. and Drinker, P. A solvent vapor, carbondisulfide. *J. Am. Med. Assn.* (1943) *122,* 217.
47. Mellon, R. R., Locke, A. and Shinn, L. E. Anti-enzymatic action of sulfanilamide's bacteriostatic action. *Am. J. Med. Sci.* (1940) *199,* 749.
48. Meyerhof, O., Ohlmeyer, P. and Mohle, W. Über die Koppelung zwischen Oxydoreduktion und Phosphatveresterung bei der anaeroben Kohlenhydratspaltung. *Biochem. Z.* (1938) *297,* 90.
49. Oppenheimer, C. *Die Fermente und ihre Wirkungen.* G. Thieme, Leipzig. 1925, and supplements issued in later years.
50. Oppenheimer, C. and Stern, K. G. *Biological Oxidation.* Nordemann Pub. Co., New York. 1939.
51. Peters, J. P. and Van Slyke, D. D. *Quantitative Clinical Chemistry.* Williams and Wilkins Co., Baltimore. 1932.
52. Quastel, J. H. in *Page's Chemistry of the Brain.* Charles C. Thomas, Baltimore. 1937.
53. Quastel, J. H. Respiration in the central nervous system. *Physiol. Rev.* (1939) *19,* 135.
54. Quastel, J. H. and Wheatley, A. H. M. Narcosis and oxidation of the brain. *Proc. Roy. Soc. Lond.* (1932) *112 B,* 60.
55. Quastel, J. H. and Wheatley, A. H. M. Effects of amines on oxidations of the brain. *Biochem. J.* (1933) *27,* 1609.
56. Quastel, J. H. and Wheatley, A. H. M. Narcotics and brain oxidations. *Biochem. J.* (1934) *28,* 1521.
57. Rapkine, L. Sulphhydryl groups and enzymic oxido-reduction. *Biochem. J.* (1938) *32,* 1729.
58. Ray, T. W. and Deysach, L. J. Storage of manganese by thyroid. Effect on oxygen consumption of the guinea pig. *Proc. Soc. Exp. Biol. Med.* (1942) *51,* 228.
59. Rimington, C. and Hemmings, A. W. Porphyrinuric action of drugs related to sulfanilamide. *Biochem. J.* (1939) *33,* 960.
60. Roughton, F. J. W. Carbonic anhydrase. *Ergeb. d. Enzymforsch.* (1934) *3,* 289.
61. Roughton, F. J. W., Dill, D. B., Darling, R. C., Graybiel, A., Knehr, C. A., and Talbott, J. H. Some effects of sulfanilamide on man at rest and during exercise. *Am. J. Physiol.* (1941) *135,* 77.
62. Sahlin, B. Untersuchung über die Einfluss einiger Kaliumsalze auf die Succino-dehydrogenase. *Skand. Arch. Physiol.* (1925) *46,* 64.
63. Seel, H. Über den Einfluss des Phosphors auf den respiratorischen Grundumsatz bei gesunden jungen Ratten. *Arch. f. exp. path. pharm.* (1928) *127,* 212.
64. Sellei, C. and Mayer, G. Über die Wirkung der Schlafmittel. *Arch. f. exp. path. pharm.* (1938) *188,* 699.
65. Shapiro, L. B. Sodium amytal; Effects on oxygen consumption rate in the psychoses. *J. Nerv. Ment. Dis.* (1937) *85,* 305.
66. Sherif, M. A. F. The effect of certain drugs on the oxidation processes of mammalian nerve tissue. *J. Pharm.* (1930) *38,* 11.
67. Smith, P. K. The effects of sulfanilamide and sulfapyridine upon the blood pigments of white rats. *Am. J. Med. Sci.* (1940) *200,* 183.
68. Sollman, T. *A Manual of Pharmacology.* W. B. Saunders Co. Philadelphia. 1942.
69. Strecker, E. A. and Ebaugh, F. P. *Clinical Psychiatry.* P. Blakiston's Son & Co. Philadelphia. 1935.
70. Tauber, H. Non-proteolytic enzymes. *Ann. Rev Biochem.* (1941) *10,* 47.
71. Tschernikow, Gadaskin, I. D. and Gurewitsch, I. I. Oxydation von Benzol in der isolierten Leber von Warm- und Kaltblutern. *Arch. f. exp. path. pharm.* (1930) *154,* 222.
72. Voegtlin, C., Rosenthal, S. M. and Johnson, J. M. The influence of arsenicals and crystalline glutathione on the oxygen consumption of tissues. *U. S. Pub. Health Rep.* (1931) *46,* 339.
73. Von Oettingen, W. F. Organic chemical industrial hazards to health. *Physiol. Rev.* (1942) *22,* 170.
74. White, W. A. and Jelliffe, S. E. *Nervous and Mental Diseases.* Lea and Febiger. Philadelphia. 1913.
75. Wortis, S. B. Respiratory metabolism of excised brain tissue. *Arch. Neurol. Psychiat.* (1935) *33,* 1022.
76. Wright, C. I. The respiratory effects of morphine, codeine and related substances. *J. Pharm.* (1934) *51,* 327.
77. Wright, C. I. and Barbour, F. A. The respiratory effects of morphine, codeine and related substances. *J. Pharm.* (1935) *54,* 25.
78. Wright, C. I. and Barbour, F. A. The respiratory effects of morphine, codeine and related substances. *J. Pharm.* (1936) *56,* 39.
79. Zorn, C. M., Muntwyler, E. and Barlow, O. W. The effects of certain barbiturates upon the oxygen uptake and anaerobic reduction of methylene blue by rat liver and brain. *J. Pharm.* (1939) *66,* 326.

Hypnoanalysis as Psychotherapy

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Most practitioners of the healing arts are well aware that hypnosis, as an adjuvant to therapy, has a long and honorable history. They are acquainted with its romance, and especially with the story of its place in the armamentarium of ancient Persian, Jewish and Greek physician-philosophers. At the same time, they share with the laity a gnawing and persistent suspicion not only of the instrument itself, but of those rash spirits (such as this writer) who deal with it either in a medical or investigative way.

Such a prejudice has deep roots and seems to be founded upon a tradition of disrepute dating from Mesmer. When one reads the reports which the French Academy's Commissions of inquiry rendered upon Mesmerism—Commissions which included Lavoisier, Baillie and our own Benjamin Franklin—one is struck by the fact that so much of these documents was vituperatively directed toward the person of Mesmer himself, indicating by this the resentment which the extravagant physician aroused in his colleagues. This flamboyant, fabulous character, who seems to have been scientifically integrated and sincere but somewhat obnoxious personally, will have much to answer for when the final chapter in psychotherapy has been written; for it was because of him that hypnosis came under a ban, and a valuable treatment-tool was taken from the hands of the sober scientist and entrusted to charlatans and quacks. Yet, in spite of the tyranny of silence, scoffing and degradation leveled against it, hypnosis became the medical ghost that refused to be laid. Within half a century James Braid was championing it, and in subsequent years it became identified with such resounding names as Bernheim, Liebault, Charcot, Janet and Freud. In the clinics at Nancy and in the Salpetriere it underwent a powerful rejuvenation. Courageous physicians braved the scorn of colleagues by openly writing of it. Janet carried it to new heights in his work with the suggestive therapies. Its acme was achieved in the early days of psychoanalysis when Breuer and Freud employed it in their first tentative formulations of the psychotherapeutic form that was to supplant all others. But its sorrowful destiny caught up with it and it was once more abandoned without ceremony. Now, in our day, it is again making an energetic bid for respectability through its incorporation in a psychotherapeutic technique called hypnoanalysis.

Hypnoanalysis, as the name implies, leans heavily both upon psychoanalysis and hypnosis. It attempts judiciously to combine the best features of each, drawing upon the former for its interpretive core and much of its theoretical base; from the latter it abstracts an alternate "royal road to the unconscious." It weaves the two into a therapeutic mode of approach to the personality which will achieve the goal of seeking out the hidden pathogenic agents, realizing an abreaction in which the total personality will share, and then of redistributing more hygienically the energies formerly exploited by the pathological process. It has shown itself able to do this more rapidly than alternate approaches, while at the same time sacrificing none of the lasting benefits of treatment along dynamic lines. It has already been demonstrated to be of considerable value in a wide range of clinical problems including many of the psychoneuroses, behavior maladjustments and pre-psychotic states. At the present time it would appear that it holds bright promise for the future.

The technique of treatment here presented is a methodological variant of hypnoanalysis developed in this writer's clinical work. There are other forms, notably those used by Gill and Brenman at Topeka, by workers at Bellevue, by Erickson at Eloise, and by British medical psychologists. In the form of which this author has the most knowledge, treatment begins with a period of in-

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tensive training in hypnosis. The patient is *taught* how to be hypnotized. The special means for achieving the so-called trance state varies from case to case, depending upon the condition of the patient, the complaint he brings to analysis and the special problem involved. The simplest guide-rule for a clinician to observe in attempting hypnosis is that which requires him to capitalize on existing physiological trends of which his intuition and clinical insightfulness appraise him. The "training in hypnosis period" should consume no more than a week. At the end of this time, the patient should have achieved three abilities which will influence the future course of the analysis: he should be able to attain the hypnotic trance state immediately upon the suggestion of the analyst; he should be able to carry out post-hypnotic suggestions expeditiously; and he should be able to revert memorially to former historical scenes and places without difficulty. Much care must be exercised by the clinician in dealing with the last, since he must encourage two varieties of memoral reversion: the *regressive,* where the patient remembers former events and regards them with his present outlook; and the *revivified,* where there is actually a return to previous biographical settings and the patient recapitulates the events as if he is currently partaking in them. During this initial phase it has been found not only feasible but beneficial to the course of therapy, deliberately to ignore the pain or perplexity of the patient and to concentrate upon training.

In the middle phase of therapy, the free-associative method of psychoanalysis is utilized. In this, as we know, the patient is requested to choose a starting point and to associate without regard to content or form. Such hours follow upon one another until resistances are encountered. At this point, rather than await their dissolution or attempt to analyze them in orthodox fashion, hypnosis is resorted to in order to undercut them. The patient is hypnotized and requested to reveal the stumbling-block which has manifested itself in free-association. If it is a historical matter, either regression or revivification may be used, although this writer prefers the former early in treatment and the latter later on. Now at this point there enters a special aspect of hypnoanalysis which, for want of a better name, may be termed the *interim phenomenon.* It has appeared that patients unvaryingly display the following course of events: (1) they encounter resistance to free-association; (2) they recount or reenact the crucial event or phantasy; (3) soon thereafter they reveal the same material to which they had shown resistance, but this time in the waking state and only such material as is memorially valid. In other words, the process of revelation under hypnosis exerts an effect upon the conscious ego, preparing it in the interim for the disclosures—often unwelcome and always uncomfortable—which have already been made while the subject was in the trance state. Because of the operationism of the interim phenomenon, there is no need to analyze the resistances and one can deal with this crucial material directly.

It is of utmost importance that great care be exercised in respect of abreaction. Practitioners will note that, under regression and revivification, those dramatic events of earlier history which are pathogenic in each case will be enacted. To rest here, however, would be to commit a serious tactical error. It is a cardinal principle of hypnoanalysis that abreaction must take place in the waking state to insure the participation of the entire functioning organism in the therapeutic process. Unless this is accomplished, one no longer can be said to be hypnoanalyzing and all the criticisms directed upon the superficial suggestive therapies will apply.

Further to assure the full benefits of therapy, to guarantee the readiness of ego for the reception of repressed, rejected, or otherwise deflected materials of memory or imagination, and to provide for the validation of all that arises during the analysis, this clinician has come to resort to the practice of inducing an amnesia following each episode of hypnosis. This procedure is highly recommended.

When it has become clear that all the factors accounting for the therapeutic problem have been exposed and reacted to, the final phase of therapy is embarked upon. In this,

the transference relationship that has been, in the past, exploited for the continuity of treatment, is central. This phase may be described as almost completely educational. From the exploration of the total organism which has preceded, certain unhealthy ideas, goals, opinions and attitudes, based upon misconceptions and the employment of well-known mechanisms of defense, have been discovered. It is now the task of the clinician to strive toward the reeducation of his patient in respect of these misconceptions and toward his reorientation along more hygienic lines. This is done by the usual psychoanalytic techniques, but is reinforced by the judicious employment of post-hypnotic suggestion. In effect, the new goals, the new ways of regarding the past and the new style of life, are literally engrafted upon the personality after they have been accepted by the conscious ego. More than merely verbal acquiescence in the novel and healthy aims is required by hypnoanalysis. It is not enough for the patient to be rationally receptive toward these healthful proposals; it is of paramount import that they be accepted and incorporated without qualification into the basal layers of the personality. Finally, the transference relationship is dissolved. This is done by redistributing its energies along the paths indicated by the therapeutic course. Here again hypnosis is heavily drawn upon as an agent of enforcement capable of exerting an effect upon components of the organism not otherwise accessible.

At this stage of research in hypnoanalysis, it is impossible strictly to define its operational field. So far it has been found effective with a wide variety of diagnoses. This author has used it with excellent results in the following conditions: hysterical somnambulism, anxiety neurosis, homosexuality, alcoholism, kleptomania, schizoid personality, symptomatic asthma, frigidity, adult maladjustment, conversion hysteria, psychopathic personality, problems in adaptation and pre-psychotic personality types. Indications of success appear also in the work of certain of the writer's colleagues who are dealing with other types. The technique is applicable in every instance where a dynamic investigation of the personality is wanted, and to the treatment of such psychogenic disorders and aberrations of behavior in which there is presented to therapy a relatively intact ego. The limitation with regard to the intact ego is proposed as the result of current work, wherein it has been brought to our attention that the technique at present should be limited to such cases until research with it has clarified the particular difficulties which arise when this caution is violated. It is felt that the status of the problem is as yet in a research phase. In all the categories mentioned, and in the manifold others which are met in daily practice aside from instances of deterioration or frank psychosis, the method is one of choice. It is rapid and effective. No one of this writer's cases has extended for more than a few months, and except for instances where therapy had to be discontinued, satisfactory results have been obtained uniformly.

On the other hand, it must be frankly stated that there are inherent hazards involved in hypnoanalysis and certain cautions have to be observed. The technique offers many temptations to the clinician and demands more restraint than other psychotherapeutic modes. One of the rocks on which treatment may founder involves the ego. This writer has found it all-important to insure that the ego is in the proper state of preparedness for the reception and absorption, without undue conflict, of such crucial revelations as may arise from the unconscious as a result of hypnotic probing. On occasion he has erred in neglecting to give amnesia post-hypnotically following the raising of repressed matter; each time this happened the consequences were almost catastrophic. He has, since, made it a general rule to induce post-hypnotic amnesia and to depend upon the already discussed interim phenomenon to accomplish the subtle work of readying the ego to receive what it had once rejected. This is a wise precaution, especially in view of the fact that, in the penetration, hypnosis is a sharp and incisive instrument. Only practice will provide the clinician with those insights into the nature

of the tool which will bring it under his control.

Another foundering point for hypnoanalytic therapy is the danger that the method lends itself so easily to transportation from a dynamic depth approach dealing with the festering pathogenic agents to a superficial suggestive mode. Everyone knows that symptoms can be suggested away, that the methods of suggestion can be utilized for purposes of immediate relief. Faced with an acute and painful situation, lacking time, himself sympathetic and anyhow utilizing hypnosis in the treatment, the clinician may be tempted to abandon hypnoanalysis for hypnosis. Relief may well follow, but then it will be symptomatic relief only and the basal infection will remain.

Finally, another less comfortable and, perhaps, less avoidable hazard is inherent in the method. The hypnoanalyst, in the performance of his work, is thrust into a form of relationship with his patient that transcends even the transference situation obtaining in routine psychoanalysis. The object of his ministrations is prone, unresisting, pliable, completely trusting. This offers a setting almost unknown in any other form of treatment. The practitioner must have his own personality, his own frustrations, intimate wants, aggressions, impulsions and hostilities well under control if he is to operate with the requisite scientific circumspection as a hypnoanalyst.

The method of hypnoanalysis aligns itself with psychoanalysis as a form of therapy which aims at routing out from the deeper levels of the personality the specific agents responsible for the observable pathology. It operates to expose the basal mechanisms and processes on which depends the pathological process clinically visible or at least reportable as aberrative behavior, psychogenic disorder and malfunctioning, and maladjustment. Under its methodological terms, it circumvents or disposes of the objections classically leveled against the use of hypnosis in therapy. It guarantees the participation in abreaction of the total personality; it deals with basic sources of conflict rather than symptoms; it exploits the transference relationship (which it views in a special manner of which we cannot here treat); it establishes therapeutic controls and safeguards; and it enables continued validation of analytical material.

In summary, hypnoanalysis is a radically abbreviated form of dynamic psychotherapy, the operational field of which has been defined as extending to cases wherein a relatively intact ego is presented to therapy. The method makes a special demand upon the clinician, relating to his observance of certain operational rules and to his self-knowledge. It is, in short, another weapon in our relentless and unremitting fight to free mankind from those ills and perplexities which blight his existence and shorten his days.

BIBLIOGRAPHY

1. Breuer, J. and Freud, S. "Studies in Hysteria." *Nerv. and Ment. Dis. Pub.*: New York, 1936.
2. Erickson, M. H. An experimental investigation of the possible antisocial use of hypnosis. *Psychiatry, 2,* 1939, 338.
3. Erickson, M. H. and Kubie, L. S. The successful treatment of a case of acute hysterical depression by a return under hypnosis to a critical phase of childhood. *Psychoanal. Quart., 10,* 1941, 583.
4. Farber, L. H. and Fisher, C. An experimental approach to dream psychology through the use of hypnosis. *Psychoanal. Quart., 12,* No. 2, 1943, 202.
5. Ferenczi, S. The role of transference in hypnosis and suggestion. "Contributions to Psychoanalysis." *Badger*: Boston, 1916.
6. Fisher, C. Hypnosis in treatment of neuroses due to war and other causes. *War. Med. 4,* 1943, 565.
7. Freud, A. "The Ego and [illegible] Mechanism of Defense. *Hogarth*: London, 1937.
8. Gill, M. M. and Brenman, M. Treatment of a case of anxiety hysteria by a hypnotic technique employing psychoanalytic principles. *Bull, Menninger Clin., 7,* No. 5-6, 1943, 163.
9. Hull, C. L. "Hypnosis and Suggestibility: An Experimental Approach." *Appleton-Century*: New York, 1933.
10. Lindner, R. M. "Rebel Without a Cause." *Grune and Stratton*: New York, 1944.
11. Lindner, R. M. Hypnoanalysis in a case of hysterical somnambulism. *Psychoanal. Rev., 32,* 1945, 325.

Education, Re-Education and Psychotherapy*

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There seems to be a tendency in modern psychiatric thought to minimize the role of the intellectual function, since the latter is so often regarded as an artifact. It will therefore be the task of this discussion to inquire into the biologic significance of the functions of cerebration and intellection and assay their importance in the maintenance of mental health and to the problems of psychotherapy.

To begin with fundamentals while avoiding as far as possible artificial dichotomies, it can be stated that as matter reaches a certain state of structural complexity it begins to demonstrate certain properties which we call the vital properties. There is no sharp line of demarcation between the animate and inanimate, but to the extent that a substance exhibits the properties of the animate it possesses the quality of drive, or from a more philosophical viewpoint, *elan vitale*. The drive will diverge in the direction of two main goals, viz., race-preservation and self-preservation. Whereas, in the lower species the patterns of action which these drives are to assume are already well-formed and defined at birth, "built-in" in the form of instinct, in the higher species of mammals and particularly in man a new experiment is being evolved. The drives are left in a relatively amorphous state, awaiting the conditioning influences brought about by our cultural milieu.

Out of the primary drives are developed offshoots, which we think of as aggressiveness, combativeness, acquisitiveness, the sexual drive, tendency to gregariousness, aesthetic sense, etc. These drives, regardless of the names we choose to attach to them, by anastamosing and combining in an infinite variety of ways energize and motivate our behavior toward our various goals. Accompanying the drives are the affect, the emotion, the feeling-tone.

However, this energy or power system requires regulation and direction. It requires conditioning so that not only may the internal relations be mutually adapted, but that they may be also adapted to the external environment. To obtain information from the external environment, especially where the structure of the organism has attained great complexity, highly specialized receptors must be developed. In such an intricate ecological setting it is necessary not only that the organism perceive the stimuli, but that it also apperceive them. These stimuli must be weighed, measured and appraised before favorable adaptation to the impinging stimuli can be made. Certainly, in organisms high in the phylogenetic scale of development, adjustment to external relations is an adjustment to the meaning and significance of the external environment. This requires an elaborate interpretive function of consciousness and preconsciousness. If the appropriate affect and drive is to be associated with any concept the latter must have been evaluated for its significance to the organism. It is only the most primitive and hence most violent events in the environment that the organism can adjust to with fundamental reflex and humoral reactions, e.g. sudden threat of death.

With other, more complicated situations, the interpretive function of consciousness is unavoidable. Can man automatically and invariably make the optimum interpretations of the conditions encountered in his civilized environment? Obviously not. Obviously, therefore, it is the function of education to train and condition the individual to certain optimum levels for appraising his milieu. Such conditioning should, perforce, be in conformity with the significant aspects of reality.

It may be pointed out in refutation, that psychoses and mental disorders are not rare among the educated, and hence the role of education is often lightly dismissed as immaterial. However, it must be noted that,

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barring the administration of medication, surgical and other physical procedures, any other form of therapy is necessarily mediated through the sensorium and the interpretive-cognitive aspect of the psyche. The most intensive psychotherapy which claims to be concerned only with the primary affective-instinctual components of the personality must, nevertheless, be mediated through the sensorium and the interpretive component of the intellect. Pschoanalysis, for example, is certainly dependent on the cognitive apparatus, for it is noteworthy that the unintelligent are not considered good material for psychoanalysis.

Here again we are not dealing in absolutes, in solid black or solid white. If the presenting crisis is of an order which involves threat to life, threats to most cherished objects, roles or positions invested with profound and powerful affect, the latter will overcome the restraints and inhibitions of higher conditioning factors. The most integrated and best-educated soldier may break under repeated exposure to the threat of death. There is a breaking-point for every individual, a resultant of the interplay of all forces brought to bear on him. The problem, however, revolves about the instances of low-breaking points, where the conditioning and modifying factors of these drives appear to permit the disintegration of the personality under comparatively and apparently light stress.

What conduces to a low threshold of stress-toleration? What conditions disturb psychic homeostasis? Upsurges of affective stimuli may occur as a result of altered bodily states, as a result of damping of the inhibiting and conditioning mechanism; e.g. alcohol intoxication and other forms of physiological impairment. We also have reason to believe that the more somatically-linked affect and drive may show some constitutional weakness, giving rise in their marked forms to what we sometimes term "process schizophrenia." Ordinarily, however, the breakdown in personality under apparently mild stress is importantly contributed to by the faulty conditioning of the apperceptive apparatus. This, naturally, means faulty education.

Even the realistic and well-balanced apperception of many undisputed facts in our complicated environment is not a simple stimulus-response activity, but requires much skill and training of the cognitive and apperceptive apparatus. Training for this becomes a very important and urgent function of our educational institutions.

As a result of such acquisition and perception of facts, acquired characteristic patterns of reaction or adjustment in the form of attitudes are brought into being. The attitude is a "set" with which the organism meets certain conditions in the environment. Attitudes become powerful, either for the maintenance of a state of adequate integration and psychic homeostasis, or in the destructive cleavages tending toward dissociation or disintegration. Educators are becoming increasingly conscious of the biological role of education. Prescott[1] has aptly stated:

"In the first place it is the task of the school to expose the individual to a great body of facts. These facts need to be sufficiently balanced and broad to lessen the likelihood that attitudes will be founded on biased and inadequate knowledge."

It is the attitude which often carries the emotional charge and, through its accompanying drive, is manipulated in life as well as in the psychotherapeutic setting. It is the bridge between the intellectual and affective-instinctual life of the individual. Since attitudes are founded on experience and fact, the importance of the latter becomes apparent. This point has been emphasized by Dunbar[2] in the following statement:

"C. M. Campbell has called attention repeatedly to this aspect of our problem, saying that 'the study of beliefs' is part of the general study of the mechanism of man in adaptation to his environment. The term, health, is now coming to include sanity of beliefs as well as soundness of body . . . man's environment to which he must adjust includes not only (a) supplies to acquire and (b) hostile organisms, but also the spiritual forces of a social environment . . . man's beliefs add to the quality of life and give it value and may also prolong it . . .

beliefs affect the actual length of life of individuals and groups and to scrutinize them is the most important and the most difficult task in the field of public health."

It can be readily appreciated that there is some basis for dividing education more or less arbitrarily into two complementary phases, to wit: 1) affective education; 2) orientative education. The major part of the first aspect usually takes place in the early formative years of life and is mediated largely through parents and siblings. The major part of the second aspect of education, which is the more superficial, is usually administered by our educational institutions.

The so-called depth psychologies such as psychoanalysis are accustomed to consider mostly the affective and instinctual disturbances as the starting point of mental and personality disorders. Thus many of the paranoid states are believed to arise from an unconscious homosexuality. From one point of view they may be traced to misinterpretations in the orientative functions of the psyche and by their crystallization into attitudes and beliefs may become charged with affect and instinctual drive. Experiences in the present war tend at least partially to confirm this contention. When bombed-out civilians were given immediate treatment and rest and a good catharsis of their experiences immediately obtained, most of them made complete recoveries. If an interval of a week or more elapsed between the psychic trauma and treatment the symptoms tended to become fixed. The same is true of combatants. Unless treatment is immediately administered the affect attaches itself to complaints which are then used in the service of some secondary gain.

As far as the paranoid forms of psychoses are concerned we may see an analogous process. N. Cameron[4] has expressed his opinion that during early childhood the effect of adult displeasure, rebuff or ridicule is to withdraw the individual from social interchange and hence possible exposure to correctional experiences. Without a good social interchange the field of thinking is contracted and restricted to a sphere of insufficient validity.

"A Paranoiac"[5] states:

"It is presented (that is, paranoid thinking) as founded on a misinterpretation of the significance of fact, for the correction of which he has not been fortunate enough to have obtained the necessary assistance. It is presented as having begun at a time during life—at an early age or later and as developing into a delusional system through misinterpretation of the significance of other facts seen in the light of the original misinterpretation, and through misinterpretation of still more facts seen in the light of all the misinterpretations that have preceded, and so on and so on, each one in turn supported more strongly than the last, with conceit and suspicion or their opposites arising and increasing as a result of social disapproval—not at all as result of any innate morbidity."

"A Paranoiac" gives many examples from daily life showing the results of such misinterpretations. Amongst the most amusing is one which runs somewhat as follows:

During the height of Irish immigration in the latter part of the last century one poor Irishwoman came to New York and found employment as a charwoman. After having saved a little money she went to a dentist for treatment which she needed badly. The remaining teeth had to be extracted and the dentist prepared two dentures. When they were ready, the woman refused to wear them or accept them and sought redress for this claimed injury. Because of paranoid charges against the dentist and her refusal to accept the dentures which were made for her and for which she had paid, and for which a refund by the dentist would obviously mean an injustice to him, she finally came to the attention of the authorities. On psychiatric examination she was declared insane, suffering from paranoid dementia praecox. While awaiting deportation to Ireland a casual remark of this patient caught the attention of the social service worker on the case. Upon more thorough investigation it developed that this poor Irishwoman had been under the impression that the dentures would contain her very own teeth. When this misapprehension or misinterpretation

was cleared up the woman ceased being paranoid.

Educational theory and practices, as we well know, are coming under closer scrutiny, and it may be said generally that while current trends in education tend to foster extreme individuation, the growth of the self is not equally well provided for. The result is a very serious and basic discrepancy, epitomized by the glorification of the slogan, "rugged individualism." As Fromm[6] has remarked:

"If every step in the direction of separation and individuation were matched by corresponding growth of the self, the development of the child would be harmonious. This does not occur, however. While the process of individuation takes place automatically, the growth of the self is hampered for a number of individual and social reasons. The lag between these two trends results in an unbearable feeling of isolation and powerlessness, and this in turn, leads to psychic mechanisms which later on are described as mechanisms of escape."

We might also describe the results as a kind of tubular intellect. For the correction of these elements of maladjustment the reformation of basic attitudes is necessary. Unquestionably there are mental disorders arising principally from the distortions of the more somatically-linked affect and instinctual drive. But even such distortions are often maintained through the sensorium and intellect, whose appreciation of reality, originally thus conditioned, maintains the affective disorder. In consequence the individual further exerts a selective action on his perceptions of reality, producing a fixed system of interaction.

In psychotherapy it becomes necessary to attempt to break this vicious circle. The analyst and psychotherapist allow, by their permissive attitude, the liberation or partial liberation of distorted affects. Through the transference and suggestions of therapist it follows that the therapy is accompanied by some enlargement of consciousness and intellect. There is still the possibility, nevertheless, that much of the drive thus liberated, much of the affective valence thus rendered available, may be incorrectly combined. This is the meaning of the transference neurosis. Chances for combinations which are socially well adapted and personally gratifying, too, are increased by placing at the individual's disposal a greater range of facts, attitudes and concepts. Furthermore, if the properties of these facts and attitudes are shown in their context and their relationships to the whole are carefully delineated, the choice is broader and more accurate. This was the original intention of education and must be made the aim of reeducation.

In individual psychotherapy what reeducation takes place occurs largely through the transference. The patient accepts this orientation mostly on faith, because the therapist says so. He is therefore dependent on his therapist and it may still be questioned whether analysis of the transference neurosis may not still leave much affective valence unsatisfied. Indeed, one often sees clinically schizophrenics who have recovered from the psychotic episode, exhibit no psychotic manifestations, except what we may call "free floating anxiety."

It would seem, therefore, that the sensory-apperceptive-intellectual part of the personality must be equally re-ordered for optimum psychotherapeutic results.

REFERENCES

1. Prescott, D. A.: "Emotion and the Educative Process," American Council on Education.
2. Dunbar, H. Flanders: "Emotion and Bodily Changes," *Columbia University Press,* New York, N. Y.
3. Paster, S.: "Group Psychotherapy in an Army General Hospital," *Ment. Hygiene* 28: 4, 529-536, Oct. '44.
4. Cameron, N.: "Development of Paranoid Thinking," *Psychological Review,* March 1943.
5. "A Paranoiac"; "Paranoia from the Subjective Point of View," *Psychoanalytic Review,* Vol. VIII, 1926.
6. Fromm, Erich: "Escape from Freedom," *Farrar and Rhinehart.*
7. Murray, J. M.: "The Syndrome of Operational Fatigue in Flyers," *Psychoanalytic Quarterly,* Vol. XIII, No. 4, 1944.
8. Freud, S.: "On Narcissism: an Introduction," Collected Papers, V. 4.
9. Klapman, J. W.: "Some Impressions of Group Psychotherapy," *Psychoanalytic Review,* V. 31, No. 3, July 1944.

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Neurological Clinical Pathological Conference

of the

Cincinnati General Hospital

CHARLES D. ARING, M.D., Editor

CASE NO. 123958

Presentation

The patient, a colored man, had been seen in our Out Patient Department in June 1939, five years before his death at the age of 65 years. He complained of pain in the lower right quadrant of the abdomen and urinary dribbling. He had not been able to work for the previous six months during which period he had lost 20 pounds. His weight was recorded at 138 pounds. During the clinical study a positive blood Kahn and Wassermann were found incidentally and then a story compatible with the development of chancre 20 years previously was elicited. The only abnormal findings were sluggishly reacting pupils, an enlarged prostate gland, and a blood pressure of 158/92. He was noted to have experienced diplopia "quite frequently." Two courses of ten bismuth injections each were administered over a period of four months.

In August 1939 the pain was recorded as being in the left lumbar region. There were epigastric pain, eructation, and occasional nausea after meals. At that time he was said to be somewhat undernourished. Roentgen studies substantiated the probability of chronic duodenal ulcer. In May 1940 roentgen examination visualized a duodenal ulcer which was noted to be active.

Dietary measures and medication were of little avail. In June 1940 he developed cough and retrosternal pain described by one observer as dull, by another as severe; he expectorated a few flecks of blood. In July 1940 the following signs were recorded; he appeared chronically ill, blood pressure 130/90, irregular pupils which reacted sluggishly, nasal septum perforated, small cervical and large hard inguinal and femoral lymph nodes, enlarged heart, high pitched rasping pericardial friction rub over entire precordium, and generalized abdominal tenderness. Roentgen examination of the chest revealed clear lung fields and an enlarged heart. The venous pressure in the antecubital vein on each side was 12 cm. of water. An electrocardiogram was recorded as follows: Rate 100, sinus mechanism, P4 low voltage, PR .18 sec., QRS .06 sec., QRS 3 slurred, low voltage, T1, 2, and 4 inverted, T3 diphasic, Q 4, 1 mm. Other laboratory studies were normal, except for a red blood count of 3.8 million and hemoglobin of 11 grams. The white blood count was 3500 to 4000 with 67 per cent neutrophils.

The friction rub disappeared in August 1940 and the heart decreased in size, a point substantiated by serial roentgenograms. He improved and gained weight, and for the remainder of 1940 had no complaint except low back pain.

During the next 1½ years he continued to gain weight. In August 1942 coughing and anorexia occurred and over a period of two months he lost 30 pounds. He was admitted to the hospital because of a pleural effusion on the right, which with the aid of roentgen ray was estimated to occupy the lower ¾ of the right lung field. The effusion was tapped and no organisms were demonstrable in it. During August and September 1942 five concentrated specimens of sputum were examined and no tubercle bacilli found. An electrocardiogram showed a heart rate of 100; sinus rhythm with ventricular extrasystole L., PR .21, QRS .11, LAD., auricular extrasystole L4., T low voltage all leads. He consistently ran an afternoon-evening fever up to 102° F.

He remained in the hospital for a year, gaining much weight and absorbing the pleural fluid. Repeated sputum examinations did not disclose tubercle bacilli, and smears and pig inoculations of the pleural fluid were negative. With bed rest the fever subsided; later he became ambulatory and at the time of his discharge showed a considerable thickening of the pleura at the right base.

In February 1944 the patient noted that numbness developed over a period of one week in the left thumb and fingers, followed in three weeks by numbness of the left side of the face. This was followed in March by progressing weakness and numbness in the left extremities.

On March 7, 1944 the following abnormalities were found: subjective coldness and numbness of left foot, headache on arising in the morning (for two weeks), frequency of urination (for over a year), pupils 2.5 mm. in diameter, reacted slightly, gross horizontal nystagmus on attempting to fix the eyes in right conjugate deviation, slight left lower facial weakness, mild to moderate weakness of left extremities, mild diminution in the appreciation of cold and touch in left face and extremities, deep reflexes hyperactive, and an extensor response on the left.

He re-entered the hospital on March 23, 1944 when he said that the headache had remitted. In addition to the symptoms recorded above, were numbness of the left side of the tongue which had appeared several weeks before and decreased hearing on the left for about the same length of time. Additional abnormal signs to those noted on March 7 were the following: the sound from a vibrating tuning fork placed on the midforehead was referred to the right ear, air conduction was decreased bilaterally, there was the slightest diminution in all modalities of sensation in the left extremities and left side of the face, more of touch than of others; he properly identified all stimuli. He was unable to identify the size, shape, form, consistency, and texture of objects with his left hand, and two point discrimination was absent in the left hand.

On April 5 the patient was found to have considerable defect in recent memory. His bed and bedstead were disheveled and dirty. He was disturbed at night. On this day a thorough sensory examination substantiated the findings of previous examinations. There was complete astereognosis in the left hand, all objects were promptly identified on the right. He had much difficulty trying to find his left hand with the eyes closed. Appreciation of position was lost in the left toes and markedly diminished in the left fingers, and was normal on the right. All movements of the left fingers and hand were extremely deliberate.

In May 1944 he again began to lose weight and to have fever, cough, and malaise. The weakness on the left was now more marked. He would have a daily spike of fever as high as 103° F (rectally), and the cough persisted.

On July 14 a neurological examination revealed no change except for reduction of resistance to passive movement of the left extremities and a stiff neck. The left astereognosis persisted unchanged. He gradually became weaker and more confused and developed large decubital ulcerations. He died on July 23, 1944.

Laboratory Data: Five cerebrospinal fluid analyses were done in the last four months of his illness, the only abnormality was the total protein content which was respectively 95, 100, 117, 115, and 55 mg. per cent. An air encephalogram on March 30, 1944 revealed grade 3 dilatation (on the basis of 4) of the lateral and third ventricles. The basilar subarachnoid spaces and the adjacent portions of the Sylvian fissures, and islands of Reil were normal. There was practically no air over the convexities. Blood Kahns were positive on March 23, May 20, and May 26, 1944. Several blood urea nitrogen determinations were normal. Many sputum examinations and three gastric washings disclosed no tubercle bacilli.

Many roentgen studies of the chest were performed; on May 23 it was noted (after a seven weeks interval) that there had been further clearing of the pleural thickening in the right lower chest and there was increased prominence of the bronchovascular markings. On June 3 there was no change and on July 19 there was in addition, pneumonic infiltrate in the right lower lung field, and a patchy peribronchial infiltrate in the left upper lung. The white blood count reached 11,300 on July 6, 1944. Type XI pneumococcus was isolated from the sputum on several occasions during May 1944.

Differential Diagnosis

Dr. George Engel: This is a problem concerning the differential diagnosis in an el-

derly colored male who had a chronic remitting febrile disease marked by cough, bloody sputum, weight loss, leukopenia, pericarditis, pleurisy, and finally involvement of the central nervous system. I think the case contains two problems: the nature of the general disease and the relationship of the central nervous system disease to the systemic disease, if any.

First in reference to the general disease, I think there can be no question that this man had syphilis. There was a history of primary sore and positive serological reactions. There also appeared to be a chronic peptic ulcer. This was demonstrated by roentgen ray. Neither of these diseases explains the symptomatology that he presented over a period of five years. This chronic disease involved various serous membranes, notably the pleura and the pericardium which, with the remitting course, suggest several possibilities, most prominently tuberculosis. I think it would be exceedingly rash to make any diagnosis other than tuberculosis in an elderly colored man who has this sort of clinical picture.

However, I think one would have to say something about the type of tuberculosis he had. I think one would have to say this patient had a fairly high degree of immunity to the tubercle bacillus, and a fairly low degree of allergy. Rich[1] has pointed out that in the response to the tubercle bacilli the tendency to form tubercles is chiefly the response to lipoids, while the tendency toward exudative reaction relates to an allergic response to the tuberculo-protein. The two do not go hand in hand. The tendency toward tubercle formation, fibrosis, or walling-off of a lesion is based on a different mechanism than the tendency to exudation, caseation, and marked inflammatory reaction. The first process relates to immunity, the second to allergy. I think there is considerable evidence in this patient's course that while the infecting dose of tubercle bacilli was high, the host immune reaction was also high because there was a chronic walling-off process with not a great deal of exudation; and when inflammatory response occurred (i.e. pericarditis, pleurisy), it tended to revert to a chronic fibrotic stage. He never had a fulminating exudative process or any of the fulminating reactions to the bacilli. I think this is of considerable importance when we come to consider the lesion in the central nervous system.

This is also consistent with the fact that various studies for tubercle bacilli were negative; they were not found in the patient's pleural fluid or in the sputum, which is to be anticipated in a patient whose ability to wall-off the bacilli was high. The lesions did not break down.

Another possibility I would consider, if this were a young girl, would be disseminated lupus erythematosus, but it is very rare in males and very rare in patients over 40. On that basis alone I would be willing to rule out this condition.

Sarcoid is a disease which resembles tuberculosis in its clinical course, but which runs a more benign course with spontaneous healing of the lesions. In sarcoid one sees more evidence of lung and lymph node involvement, and I am not aware that pericardial effusion and pleural effusion occur. I am also not sure about the lesions in the central nervous system.

One should mention neoplasm, but this can be ruled out in this patient by the long course.

The second problem is the nature of the lesion in the central nervous system, and whether the general disease is also responsible for the disease of the central nervous system. The questions are, what kind of lesion is it, where is it, and how many are there? It is impressive that the nervous system symptoms this patient developed came on slowly over the course of weeks to months, beginning with discreet focal signs —numbness of the left fingers, and gradual extension to involve sensory and motor functions on the left side of the body. I think that the course distinctly fits a space consuming or infiltrating lesion and one would think of neoplasm or granulomatous lesion. Such a slow course would be highly unlikely with vascular lesion where I would expect a much more sudden development of symptoms. In this man there was never regression of symptoms such as occurs after local softening.

The second point is the localization of the lesion or lesions. The focal signs suggest two possibilities; to review them they were: numbness of the left thumb and fingers, then the face on the left, small pupils that reacted poorly, nystagmus on right conjugate deviation, decreased hearing bilaterally, weakness of the left side of the face and the left extremities (involvement of pyramidal tract), and involvement of proprioception and stereognosis with some loss of pain, temperature, and touch in the left extremities and numbness of the left side of the tongue.

My first impression as I read these localizing signs was that this patient had a lesion in the right parietal lobe. However, it is apparent that this could not explain all the signs. Further, a space consuming or infiltrating lesion in the parietal lobe which over a period of months involves both sensory and motor function on one side would have to be a fairly large lesion. But the air encephalogram gave no evidence of a space consuming lesion; there was dilation of the lateral and third ventricles.

The air study not only reduces the possibility of a large space consuming lesion in the right parietal lobe but it also raises the likelihood of some partially obstructive lesion in the region of the aqueduct. It is obvious too that whatever caused this symmetrical dilatation of the lateral and third ventricles was not obstructing the aqueduct completely because air got in, air that was introduced by way of the lumbar subarachnoid space.

If my original thought that this patient had a lesion in the parietal lobe were correct, I then would also have to postulate some obstructive process in the region of the aqueduct, and one would think of some type of plastic exudate, particularly if considering tuberculosis or tuberculous meningitis. However, one fails to find evidence of meningitis in the cerebrospinal fluid and clinically the patient presented no signs of meningitis though at one point it was mentioned that the neck became stiff. Plastic meningitis about the base may have been expected to have involved cranial nerves. The nearest approach to cranial nerve signs besides the unilateral sixth palsy, would be the involvement of the eighth nerves.

For these reasons this interpretation didn't seem likely so I started to work my way through a neuroanatomy text and when I got into the pons, I believe I figured out where a lesion would be located to cause all these signs. A lesion located in the lateral and dorsal portion of the pons, at the level where the aqueduct terminates could explain this clinical syndrome.

The changes in hearing (marked on one side, moderate on the other) would be due to involvement of fibers from the 8th nerve as they cross in the trapezoid body. Apparently most but not all fibers cross, so with a unilateral central lesion one doesn't get complete deafness. The nystagmus is explained by involvement of vestibular mechanisms which are present in this region.

The left hemiparesis is explained by the involvement of the corticospinal fibers. Changes in sensation are explained by involvement of the medial lemniscus. While at first I thought the type of sensory changes this patient presented, notably the astereognosis, were rather characteristic manifestations of parietal lobe involvement, Doctor Aring pointed out to me that the same type of thing could be caused by involvement of the medial lemniscus. Usually there is not complete loss of sensation. Finally, a lesion in this region possibly could obstruct the aqueduct.

That would explain all the neurological signs this patient presented, and we then come back to the question, what is the etiology of the lesion? Having presented evidence that the patient had tuberculosis, and further reasons for believing the disease to be one in which one would expect a well walled-off process with tubercle formation, I should think the most reasonable interpretation would be tuberculoma of rather small size and which was well walled-off, located in the pons on the right side in such a position as to involve the medial lemniscus, lateral lemniscus, vestibular fibers, corticospinal tract, which by displacement partially obstructs the aqueduct.

In addition I would say this patient had

tuberculosis, chronic and active, of the pleura, pericardium, possibly of the lungs. He may possibly have had tuberculous peritonitis (abdominal pain and fever), but it would have had to be plastic in type and not exudative with effusion. Also he had terminal lobular pneumonia, chronic peptic ulcer, and syphilis which was asymptomatic.

Discussion of Pathology

Dr. I. Mark Scheinker: On grossly examining the nervous system the leptomeninges, gyri, and vessels of both hemispheres were of normal appearance. On coronal sections there was a moderate degree of enlargement of the lateral and third ventricles. There was a well circumscribed granulomatous lesion in the rostral portion of the right pons (Fig. 1). The extent of the lesion may be seen by referring to the photograph; it contained a necrotic core surrounded by grayish-pink tissue. The mass appeared to occlude the aqueduct of Sylvius which was displaced upward and toward the left. Microscopically the pontine lesion was a tuberculoma.

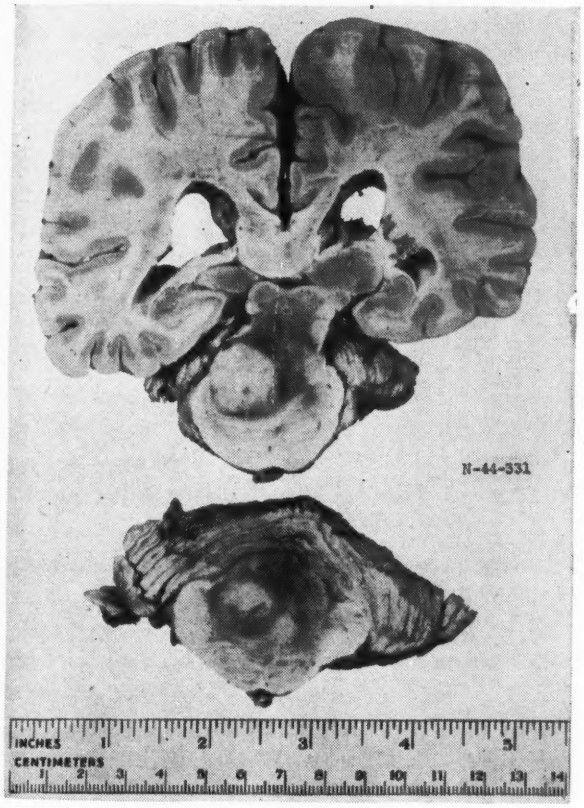

Figure 1. Photograph of two sections of the brain stem, to illustrate the tuberculoma at the rostral pontine level on the right.

Tuberculomas were found in the adrenal glands, liver, peritoneum, and pericardium. There was an acute lobar pneumonia; and many areas of focal pulmonary and pleural fibrosis, probably the result of arrested tuberculosis. In addition there was a chronic duodenal ulcer, signs of syphilitic aortitis, and glandular hyperplasia of the prostate. The blood vessels of the heart and the kidneys, and in fact generally, except in the brain, were affected by advanced arteriosclerosis.

According to Wilson[2] tuberculomas represent 3.6% of all brain tumors. If compared with older statistical data, there seems to have been a considerable decline in its frequency. A striking decline in frequency has also been observed in the occurrence of syphilitic gumma. Tuberculomas are often multiple and are mostly situated subtentorially. The cerebellum and next the rostral brain stem are sites of predilection. The tuberculomas affect chiefly children and young adults.

Clinical Diagnosis

Meningovascular syphilis.
Softening in right parietal lobe.
Chronic fibroid pulmonary tuberculosis.
Chronic pleuritis and pericarditis.

Doctor Engel's Diagnosis

Tuberculoma of the pons on the right.
Tuberculosis, chronic and active, of pleura, pericardium, and possibly lungs.
Tuberculous peritonitis, plastic.
Terminal lobular pneumonia.
Chronic peptic ulcer.
Asymptomatic syphilis.

Anatomical Diagnosis

Tuberculoma of right pons (rostral).
Tuberculosis of the adrenal glands, liver, pericardium, and peritoneum.
Acute lobular pneumonia.
Chronic duodenal ulcer.
Syphilitic aortitis.
Generalized (except brain) atherosclerosis.

REFERENCES

1. Rich, A. R. Pathogenesis of tuberculosis. Springfield, Illinois. Charles C. Thomas, 1944.
2. Wilson, S. A. K. Neurology, 2 vols. Williams and Wilkins Co., Baltimore, 1940 (Volume 1, pp. 593-594).

Industrial Psychiatry - A New Field for the Psychiatrist

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It is logical that the psychiatrist, a man who has a special knowledge of the nature and vagaries of human behavior, should be called upon to solve personal problems in industry. However the need for his services is not yet as clear-cut to the industrialist as to the psychiatrist who knows what he has to offer. The industrialist is not yet aware of the fact that he can be helped by a psychiatric consultant. There are several reasons for this situation: firstly, the number of psychiatrists available for all types of work is small, and secondly, the problems of industry seem to be so much more important in the mechanical field that the problems of personality intrude themselves only indirectly.

For generations the employer has had to deal with his employees by a rule-of-thumb method. He has certain dicta and beliefs about human nature to which he referred whenever he had a knotty problem of administration. Many of these beliefs were contradictory: i.e. "If you treat an employee kindly, he will do his best for you," but on the other hand, "You have to put your foot down hard and show your employees that there will be no fooling if you want to get results." This sort of unscientific psychological administration could lead nowhere but to the present marked schism between management and employee.

The development and growth of labor unions to their present stature and importance in industry is a reasonable result of labor consciousness and awareness. In the industrial family the employer represents the father, the man who wants results and who demands discipline and good conduct; the union is the mother person who soothes and comforts and stands up to the father, asserting the rights of the children.

In any plant with a fairly large personnel, there will always be problem individuals. In the group there may be an occasional psychotic, although it is likely that a person who is frankly insane will be detected even by laymen and hospitalized before he becomes an industrial problem. Plants, however, are riddled with psychoneurotics and psychopaths and this is even more true today when psychiatric rejects from the Armed Forces and persons discharged from the Services for psychiatric reasons constitute a large proportion of the younger employees. Many men employed during the war, who for physical reasons were rejected by the Services, would not be acceptable under the ordinary physical standards of the plants. These men will have to be employed elsewhere. The neuropsychiatric 4-F is usually an employable person. This fact was not generally recognized early in the war period and there were hundreds of cases personally known to me, of individuals rejected by induction boards for some neuropsychiatric reason and the plant managers would refuse to take them back. After induction boards learned to temper their diagnoses, this situation was modified.

Every manufacturing plant, no matter how well run, has its share of conflicts. The presence of psychoneurotics and psychopaths contributes to employer-employee friction, but the lack of psychiatric understanding on the part of the employer does even more. The mild psychoneurotic and the mild psychopath have in the past been readily employable. Tactful and judicious handling by foreman will avoid serious misunderstandings.

Even today, the mental defective, if he is properly placed in the plant, is no problem. In my own range of experience, I know of many elevator men, definite mental defectives who operate their cars safely and well. I know of others who operate simple screw machines and other automatic devices safely with a minimum waste of material. There is a story in industrial psychology of the observer visiting a plant, who watched a girl operating a machine which had a history of dismembering the fingers of a number of her predecessors. When asked how

she was able to keep her fingers intact, she replied: "Them other girls used to think. I don't do no thinkin'."

The spheres in which the psychiatrist can be of most value in industry are these: First and foremost, if he has the confidence of the plant administration, he can do a mental hygiene job in management. I frankly do not know where this has been done by an industrial psychiatrist—after all, there are only a few, but I do know of private psychiatrists in Detroit who have taken in hand the emotional, domestic and other problems of individuals in top management and have treated these persons, with the result that this adjustment in the plant is markedly improved. By caring for the employer's maladjustment, we clear up a certain number of conflicts which arise from his projection of his own maladjustment onto his employees.

Secondly, the psychiatrist is able to give helpful advice along mental hygiene lines to the worker who is perplexed, who is worried, who feels himself slipping or who is preoccupied with problems outside the plant. The study and correction of any phases of the worker's physical or mental life should aid him in adjusting. Furthermore, the psychiatrist in an industrial organization can eliminate the seriously mentally diseased persons; have them hospitalized or put under treatment. Or, if they do not need psychiatric treatment, place them in the hands of comprehending foremen and with an understanding group of co-workers. This is being done in rare instances, largely by psychiatrically untrained but forward looking supervisors with good results. With the benefit of psychiatric training even more could be accomplished in the sphere of diagnosing and treating mental maladjustments.

In order to make proper placement of workers in industry, it is necessary to know the plant. The psychiatrist can function best when he knows the nature of the conditions under which the problem worker operates. For example, if the man is on an assembly line close to others where a certain amount of speed is necessary, the worker should have a careful neurological checkup to make sure that his reactions are sufficiently rapid to avoid making mistakes and slow down the line. As a general rule, however, except in excessive speedup, which in a unionized plant no longer occurs, the assembly line is well planned and even slow workers can fit in.

In Detroit, at the present time, psychiatry is making a most important contribution in the adjustment of returned veterans and in the handling of problems arising in the application of the seniority clause in union-management contracts. Two companies after consulting with me have provided in renewal contracts with employees' unions that every returning veteran have an interview with the psychiatrist in order that he might be properly placed. At first the union representatives objected to this but when it was pointed out that the purpose was to insure for the veteran better placement in the plant they acceded to the novel requirement. Management, of course, had an interest in this procedure, for it became possible to reemploy veterans in their best capacities and tended to diminish the chances of discharge for inefficiency in the veteran's old job for which he might not be suited.

One large plant in its contract with labor provided that an employee be examined by a psychiatrist if there was any question that he might be dangerous to other employees or might be suffering from a mental disorder. I have examined men under this clause and have found both union and management highly cooperative in abiding by my recommendation.

Many industrial firms have learned the value of industrial counselling in keeping the workman contented and happy which leads toward maximum production, minimum absenteeism and low turnover. Counselors, however, vary in their ability to help the worker with his problems. Where counselling has seemed to be weakest in the industrial field has been the inability to deal with personal problems, with feelings of insecurity, feelings of unjust treatment by union, foremen or top management, hostility toward management which arose from the man's own unsound thinking, or from his sense of frustration, and in some instances from the patient's psychogenic inadequacy.

Counselors, if they have any capacity at all, may be trained and educated by the psychiatrist and are able to deal with such problems. Foremen will learn to deal with their charges more effectively and management itself can improve its function after instruction from the psychiatrist on the human mind and how it works.

A noted psychiatrist recently commented that when industry wakes up to the value of psychiatry, there will be an exodus of psychiatrists from hospitals and other places where they are now located. This may be over-optimistic. From my own experience in consulting with industrial heads and knowing intimately a number of industrial problems, I believe that many of my psychiatric colleagues will not be useful in industry. The industrial psychiatrist will have to know more than the diagnosis and treatment of mental cases. He must have a capacity to deal with borderline cases and people who are emotionally upset, and even normals who have problems. He will have to be counsellor, guide, and do the work of the small town minister or physician in straightening out domestic, economic and other problems. He will have to spend months acquainting himself with the material and personnel in the plant, an arduous task without great financial reward. Because of the fact that management in most instances does not tolerate unproductive employees the psychiatrist will have to demonstrate his commercial value. It has taken many years for industrial hygiene to justify its place because the value of preventive work is relatively unprovable and in such a subjective field as psychiatry, it is even harder to demonstrate results.

There are psychiatrists who have had dealings with industrialists and can cite cases where satisfaction was really given. Early in the psychiatrist's career in the plant he can contribute much by giving training in mental hygiene to a competent personnel department, by setting up mental hygiene programs if they do not already exist and by improving counselling programs already set up. By direct interview of inept or inadequate workers who come before the personnel department, by checking the accident-prone cases either in the hospital or through the safety director, a number of other problem individuals can be culled out and dealt with. The psychiatrist is often able to prove his value more quickly to union leaders than to management. This has been the experience of many psychiatrists working in plants. Through the union as well as through the foremen, the psychiatrist can give advice on difficult problem cases and aid in eliminating friction.

An industrial psychiatrist, must first of all have an interest in industry. Secondly, he must have the ability to sell himself to employers and union leaders, and thirdly, he must be thoroughly convinced that what he has to offer is valuable and necessary to smooth and efficient plant operation as well as being conducive to satisfaction and happiness for the worker in his job.

Dr. Peter Bassoe Is Dead at 71

Dr. Peter Bassoe, outstanding national figure in the field of neurology, an editor and founder of this journal, DISEASES OF THE NERVOUS SYSTEM, died November 5th, 1945 of a heart ailment in the Presbyterian Hospital, Chicago, at the age of 71. The medical profession suffers a great loss in his passing.

Born in Drammen, Norway, Dr. Bassoe came to the United States in 1893 and was graduated from the College of Physicians and Surgeons of the University of Illinois in 1897. He began practice in Chicago and remained there, although he made frequent trips to Europe for study and research.

Dr. Bassoe was professor emeritus of the Rush Medical College, University of Chicago, and had taught at several other schools, as well as serving as head of the neurology department at the Presbyterian Hospital. He had specialized in neurology since 1907, and was an attendant in nervous and mental diseases at Norwegian, Deaconess and Swedish Covenant Hospitals and was consulting neurologist at Grant and St. Francis Hospitals.

He was a former president of the American Neurological Society and the local Chicago society and had been head of the Chicago Institute of Medicine and the Chicago Pathological Society. His writings on neurology were many. Frequently he was a speaker at national and international meetings.

He leaves a widow, Marion; four daughters and a son.

DISEASES of the NERVOUS SYSTEM

INDEX to Volume VI

ABRIDGED TECHNIQUE IN AMBULATORY ELECTRO-SHOCK THERAPY ..... January, Pg. 18
Frederick L. Patry

AMIMIA OR EMOTIONAL PARALYSIS OF THE FACE ..... April, Pg. 106
Louis J. Karnosh

ANGIOMA INVOLVING (1) PRACTICALLY THE ENTIRE RIGHT CEREBRAL HEMISPHERE, (2) THE LEFT PARAVENTRICULAR AREA (THIRD VENTRICLE), (3) THE LEFT OPTIC NERVE, (4) THE MIDBRAIN, (5) THE UPPER THIRD OF THE RIGHT PONS, AND (6) SOME OF THE FOLIAE OF THE CEREBELLUM .... April, Pg. 119
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor

ANOXIA AND COMPOUNDS CAUSING MENTAL DISORDERS IN MAN ..... December, Pg. 365
Lewis Danziger

CEREBRAL SOFTENING, ACCOMPANYING "VASOPARALYSIS" ..... March, Pg. 88
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor

CIVILIAN MENTAL HEALTH IN WARTIME ..... June, Pg. 173
George S. Stevenson

CLINICAL IMPRESSIONS OF PSYCHIATRIC PROBLEMS PRESENTED BY VETERANS ..... May, Pg. 143
Gaylord P. Coon and James E. Roy

COINCIDENCE OF PARKINSON'S DISEASE AND CRANIAL CHORDOMA ..... February, Pg. 53
Peter Bassoe

COMMON FACTORS IN SHOCK THERAPIES ..... September, Pg. 283
L. J. Meduna

CORRELATION BETWEEN ELECTROENCEPHALOGRAMS AND DEEP REFLEXES IN NORMAL ADULTS ..... November, Pg. 337
Margaret A. Kennard and M. Dorrit Willner

DISCUSSION OF THE PSYCHIATRIC ASPECTS OF REHABILITATION ..... May, Pg. 149
Jacob E. Finesinger and Erich Lindemann

EDUCATION, RE-EDUCATION AND PSYCHOTHERAPY ..... December, Pg. 375
J. W. Klapman

EMOTIONS AND THE CEREBRUM ..... October, Pg. 312
Edward Podolsky

EPIDURAL ABSCESS (STAPHYLOCOCCUS AUREUS), THORACIC 5, 6, 7, AND 8, PROBABLY METASTATIC FROM ACNEFORM ERUPTION OF SKIN OF SUPERIOR DORSAL THORAX ..... September, Pg. 289
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor

ESSENTIALS OF VETERANS' REHABILITATION ..... April, Pg. 101
Francis J. Braceland

EVALUATION OF THE SHOCK THERAPIES ..... January, Pg. 20
A. E. Bennett

EXPERIENCES WITH PERSONALITY TESTING IN A NEUROPSYCHIATRIC DEPARTMENT OF A PUBLIC GENERAL HOSPITAL ..... July, Pg. 205
Joseph C. Michael and Charlotte Buhler

FUTURE OF NEUROLOGY ..... February, Pg. 37
Roland P. Mackay

GLIOBLASTOSIS OF THE BRAIN STEM AND CEREBELLUM WITH MALIGNANT DEGENERATION (GLIOBLASTOMA) ABOUT AQUEDUCT OF SYLVIUS AND THE FOURTH VENTRICLE ..... July, Pg. 221
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor

GROUP PSYCHOTHERAPY ..... August, Pg. 237
Howard P. Rome

HALF THE BATTLE ..... October, Pg. 310
Dale L. Groom

HEMATOMYELIA AND HEMATOBULBIA ..... October, Pg. 318
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor

HYPERTENSIVE BRAIN DISEASE ..... November, Pg. 351
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor

HYPNOANALYSIS AS PSYCHOTHERAPY ..... December, Pg. 371
Robert M. Lindner

INDUSTRIAL PSYCHIATRY ..... December, Pg. 384
Lowell S. Selling

INTRODUCTORY REMARKS ..... May, Pg. 133
Clifton T. Perkins

INVOLUTIONAL PSYCHOSES TREATED WITH SHOCK THERAPY ..... June, Pg. 189
John H. Taylor

IS A DIAGNOSTIC CLINIC FOR ALCOHOLICS A NECESSARY PART OF A SOUND COMMUNITY PROGRAM? ..... August, Pg. 245
Robert V. Seliger

MENINGOENCEPHALITIS, TUBERCULOSIS ..... February, Pg. 56
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor
MENINGOVASCULAR SYPHILIS ..... August, Pg. 256
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor
MENTALLY UNFIT: DETECTION, ELIMINATION AND DISPOSAL ..... April, Pg. 109
William C. Menninger
NARCO-ANALYSIS IN PRIVATE PRACTICE ..... November, Pg. 343
Elsie G. Adams
NARCOLEPSY IN NEGROES ..... June, Pg. 179
Philip Solomon
NERVOUS DISORDERS IN THE ARMED FORCES ..... June, Pg. 184
Edwin G. Zabriskie
NEUROPSYCHIATRY AT THE GREAT LAKES NAVAL TRAINING CENTER ..... January, Pg. 5
F. C. Southworth, Jr., L. D. Boshes and R. J. Lewinski
NEUROPSYCHIATRIC PROBLEMS IN RETURNING SERVICEMEN ..... November, Pg. 333
Howard P. Rome
NEUROPSYCHIATRIC RESIDUALS ..... July, Pg. 212
Sidney I. Schwab
NEUROTIC REACTIONS IN WIVES OF SERVICEMEN ..... February, Pg. 50
Ralph M. Patterson
NP PROBLEMS AS THEY OCCUR IN NAVAL WARFARE ..... February, Pg. 48
W. F. Kennedy
ONE YEAR'S EXPERIENCE OF A VETERAN'S NEUROPSYCHIATRIC CLINIC ..... May, Pg. 155
Clarence A. Bonner and Leo Maletz
PORPHYRIA IN RELATION TO NERVOUS AND MENTAL DISEASES ..... July, Pg. 217
Loren William Avery
PROBLEM OF MASTURBATION IN PSYCHOTHERAPY ..... January, Pg. 24
Frederick C. Thorne
PROBLEMS OF THE REJECTED MAN ..... April, Pg. 115
Gilbert J. Rich
PSYCHIATRIC PATIENT IN THE RECONDITIONING PROGRAM ..... May, Pg. 159
Walter E. Barton
PSYCHIC TRAUMA OF BECOMING PART OF A GROUP ..... September, Pg. 280
Horace G. Miller
PSYCHOPATHOLOGY OF INGRATITUDE ..... July, Pg. 226
Edmund Bergler
PSYCHOSOMATIC OBSERVATIONS OF 500 NEUROPSYCHIATRIC PATIENTS ..... October, Pg. 301
P. P. Poliak
REHABILITATION OF THE RETURNING PSYCHONEUROTIC SERVICEMAN ..... October, Pg. 315
Samuel B. Hadden
RETURNS OF SCHIZOPHRENICS FOLLOWING SHOCK THERAPY ..... January, Pg. 28
John H. Taylor
RORSCHACH STUDIES ON COMBAT FATIGUE ..... August, Pg. 250
George N. Raines and Elizabeth Broomhead
SERVING THE VETERAN ..... May, Pg. 163
Samuel Tartakoff
SICKLE CELL ANEMIA WITH BRAIN INVOLVEMENTS ..... September, Pg. 276
A. L. Skoog
SIGNIFICANCE OF SENSORY CHANGES IN HEMIPLEGIA ..... October, Pg. 307
N. Eric Bell and Louis J. Karnosh
SOCIO-PSYCHIATRIC ASPECTS OF WAR AND POST-WAR NEUROSES ..... September, Pg. 285
Ernest Harms
SOCIO-PSYCHIATRIC PROBLEMS IN REHABILITATION ..... May, Pg. 134
W. Malamud and I. T. Malamud
SOCIAL READJUSTMENTS OF RETURNING VETERANS ..... March, Pg. 83
Luther E. Woodward
STATE MENTAL HOSPITAL AN EDUCATIONAL CENTER ..... September, Pg. 269
Lewis Barbato
STUDY OF 50 VETERANS OF WORLD WAR II ADMITTED TO THE PHILADELPHIA GENERAL PSYCHIATRIC BUILDING ..... November, Pg. 348
A. Victor Hansen, Jr.
SUDDEN EXTRUSION OF AN INTERVERTEBRAL DISC ..... March, Pg. 80
Harold C. Voris
THALAMIC SOFTENING, BILATERAL (OLD HEMORRHAGE) ..... June, Pg. 190
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor
TUBERCULOMA. RIGHT PONS ..... December, Pg. 379
Neurological Clinical Pathological Conference—*Charles D. Aring,* Editor
USE OF PENTOTHAL SODIUM AS PSYCHOMOTOR DEPRESSANT IN ELECTRO-SHOCK THERAPY ..... August, Pg. 242
H. S. Rubinstein
WAR AND NERVOUS DISEASES ..... March, Pg. 69
Bernard J. Alpers
WAR NERVES ..... February, Pg. 43
A. E. Bennett

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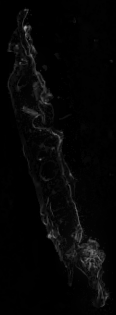
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